



**East Valley Water District  
Automated Metering Infrastructure Pilot Program**

**ATTACHMENT 2  
WORKSHEET ASSUMPTIONS**

1. **Baseline Volume of Water for Project:** 1,508.9 MG/year
  - a. *Assumptions:* Per EVWD's adopted Water Master Plan 197 gallons per capita per day (GPCD) is allocated per person x 3.44 persons per household x 365 days per year x 6,100 meters = 1,508,854,520 gallons per year, or 1,508.9 MG/year.
2. **Post Project Water Delivered:** 1,434 MG/year
  - a. *Assumptions:* Using EPA WaterSense Website: <http://www.epa.gov/WaterSense/pubs/fixleak.html>, the average household's leaks can account for 10,000 gallons of water wasted every year. Ten percent of homes have even greater leaks that waste 90 gallons or more per day (or 32,850 gallons per year). The District is planning on retrofitting AMI meters for 6,100 homes.
    - i. 90% have average household leaks:
      1.  $90\% \times 6,100 \text{ homes} \times 10,000 \text{ GPY} = 54,900,000 \text{ GPY}$ .
    - ii. 10% have 90-gallon-per-day (32,850 GPY) household leaks:
      1.  $10\% \times 6,100 \text{ homes} \times 32,850 \text{ GPY} = 20,038,500 \text{ GPY}$ .
    - iii.  $54,900,000 \text{ GPY} + 20,038,500 \text{ GPY} = 74,938,500 \text{ GPY}$  or 74.9 MG/year.
    - iv. But, using the before project water delivery of 1,508.9 MG/year - 74.9 MG/year = 1,434 MG/year after project.

With the installation of AMI, our assumption is that leaks will now be addressed almost immediately due to the real-time notification at District level. Overall, please note that these are conservative assumptions as we have not even considered behavioral changes that will occur at the residential level due to new information being immediately available to these customers.

3. **Volume of Hot Water Saved (Electric Heaters):** 3.6 MG/year.
  - a. *Assumption:* 20% of area has electric heaters.
  - b. Post project water saved (74.9) x indoor usage (40% per Water Master Plan) x 59.6% hot water (per AWWA study) x 20% electric = 3.6 MG/year.
4. **Volume of Hot Water Saved (Natural Gas Heaters):** 14.3 MG/year.
  - a. *Assumption:* 80% of area has natural gas heaters.
  - b. Post project water saved (74.9) x indoor usage (40% per Water Master Plan) x 59.6% hot water (per AWWA study) x 80% gas = 14.3 MG/year.
5. **Useful Life in Years of Project:** 20 years
  - a. *Assumption:* According to Aclara Manufacturer specifications, advanced metering equipment is expected to have a useful life of 20 years.



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6. **Percentage of Imported Water:** 3 percent
  - a. *Assumptions:* EVWD imports 3 percent from the State Water Project. Groundwater makes up 90 percent and surface water makes up 7 percent.
7. **Energy Intensity of System associated with project water savings:** 2,385 kWh/MG
  - a. *Assumptions:*
    - i. Energy costs for EVWD are calculated at 16,484,460 kWh for 2013 based on billing information.
    - ii. 21,200 AFT was pumped in 2013. This equates to 6,908 MG.
    - iii.  $16,484,460 \text{ kWh} / 6,908 \text{ MG} = 2,385 \text{ kWh/MG}$
8. **Total Output Emission Rate (default value):** 0.278 kg CO<sub>2</sub>e/kWh
  - a. *Assumption:* Using default value of 0.278 kg CO<sub>2</sub>e/kWh.
9. **EI associated with Supply and Conveyance:** 408.18 kWh/MG
  - a. *Assumption:* EVWD receives 3 percent of system water from the State Water Project through the San Bernardino Valley Municipal Water District. Using DWR Table 6 Energy Intensities for Imported Water, the following number was derived:

Pumping Plant	DWR Table 6 kWh/MG	Percent EVWD Water	EI for Imported Water
SWP - Pearblossom	13,606	X .03	408.18

10. **Additional Annual Energy Savings:** 11,431 kWh/year
  - a. *Assumption:* Using the following U.S. Environmental Protection Agency parameters to convert gasoline savings to kWh (where 1 therm equals 29.3 KWh):
    - 1) Average mileage of car and light truck is 21.5 miles/gallon.
    - 2) Average heat content per gallon of gasoline is 1.25 therms/gallon.

Mileage for Meter Reading Trucks		
Truck 143	8,053	
Truck 140	13,245	
Truck 108	5,333	
Total Miles Driven 2013	26,631	
Miles per gallon per light truck or car	21.5	miles/gallon
Energy per gallon	1.25	therms/gallon
Total Miles Driven	26,631	
Reduction in meters Years 1-3	6,100	
Total meters	24,208	
Percent reduction	25%	



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Mileage reduction	6,711	
Gallons of gasoline saved	312	gallons
Energy saved	390	therms
<b>Energy saved</b>	<b>11,431</b>	<b>kWh/YR</b>
<b>Based on above figures, EVWD estimates 312 gallons of fuel will be saved each year. <math>312 \text{ gallons} \times 1.25 \text{ therms} \times 29.3 \text{ kWh} = 11,431 \text{ kWh}</math>.</b>		